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The statistical analysis of a selected sample of labor grievance arbitration cases.

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THE STATISTICAL ANALYSIS OF A SELECTED SAMPLE OF LABOR GRIEVANCE ARBITRATION CASES.

THE STATISTICAL ANALYSIS OF A SELECTED SAMPLE OF LABOR GRIEVANCE ARBITRATION CASES

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ABSTRACT

The subject of human relations in the industrial world has contributed to a great many expensive headaches for both labor and management. In this field, several highly interesting problems arise each day for which solutions must be found if peace is to be maintained in the industrial family.

One method used in the solution of these problems is the arbitration of labor-management grievances by an impartial third party. This process has only recently been applied to the labor-management area although arbitration itself is practically as old as civilization.

Parallel to the especial interest of the industrial engineer in the arbitration phase of industrial human relations there has developed an increasing application of the mathematical and statistical theories in attempts to solve other problems of industry, not particularly confined to the human aspect.

This thesis represents an attempt to apply a minute amount of mathematics and statistics in an effort to analyze a sample of grievance cases from a given universe. Facts of each case were recorded insofar as it was possible to ascertain them. No attempt was made to apply judgement to the merits of the case or to whether or not the decision rendered by the arbitrator was correct.

The following factors were recorded for each case in the sample:

1. Date
2. Industry type
3. Union involved
4. Profession of arbitrator
5. Grievance topic
6. Decision for or against union
7. Location of the company

This recording was done using a number key for each factor with the exception of date and location. This method was deemed advisable in order to preserve the anonymity of parties taking part in the disputes. There was no desire to dwell on any discussion of particular personalities.

The sample cases were selected from the first twenty volumes of the Bureau of National Affairs Labor Arbitration Reports, and the Prentice-Hall American Labor Arbitration Reports which covered a period from 1945 to 1953. Random numbers from one to six were used to select the sample cases from the volumes, giving one sample case for every 3.56 cases in the universe.

Once recorded, the cases were tabulated according to the following combinations of factors:

1. Arbitrator Profession versus Industry Type
2. Arbitration Profession versus Union Classification
3. Arbitration Profession versus Grievance Topic
4. Industry Type versus Union Classification
5. Industry Type versus Grievance Topic
6. Union Classification versus Grievance Topic
7. Industry Type versus Geographical Area

In the cells of these blocks were recorded the percent of the cases in which the award was rendered favoring the company.

For the statistical analysis, the first three combinations of factors, as listed above, were used. The percentages from each cell of the three combination blocks were transformed to a variable, $X = \text{arc sin } \sqrt{\text{percent}}$. An analysis of variance, using the "column

and row" technique was performed on each of the three combination blocks, using significance at the 5% level for the criterion. The following results were obtained:

In the Arbiter Profession versus Industry type block:

1. Differences between Arbiters were not significant at the 5% level.
2. Differences between Industry types were significant at the 5% level.

In the Arbiter Profession versus Union block:

1. Differences between both arbiter figures and union figures were significant at the 5% level.

In the Arbiter Profession versus Grievance Topic block:

1. Differences between both arbiter figures and grievance figures were not significant at the 5% level.

Studying these three blocks in the light of the results of the statistical analysis, the following statements are made:

1. All industries studied in this sample, and as grouped for this analysis, were awarded the decision in 44% to 57.1% of cases with the exception of the Textile, Garment and Shoe industries, who were rendered the award in only 36.3% of their cases.
2. The law professor rendered awards favoring the company in a larger percent of the cases than did any other profession of arbitrator studied.

3. The professors taking part in the rendering of awards in this population of cases did not appear to be pro-union nor did the lawyers appear to be pro-management.

As a result of this study the following main conclusions were drawn:

1. Lawyers and professors other than law professors were used as arbitrators in a ratio of 2:1 over other professions.
2. Unions are no more adept at presenting cases to an arbiter than are management representatives.
3. The fact that the unions lost 50% of their cases in the majority of cells does not mean that they tend to bring to arbitration a large number of unmerited grievances.
4. The appearance of a percentage figure of 50% or something close to it in the majority of cases tends to prove neutrality on the part of arbitrators if not impartiality. Any real conclusions as to the relative impartiality of different arbiter professions would have to be substantiated by a study of the merits of each case, a subject avoided in this thesis. The fact that merits were avoided, however, does not vitiate the application of the resulting percentages on a mathematical basis to test hypotheses concerning impartiality in those cells where arbiter differences were significant at the 5% level.
5. The geographical area in which any particular company is located does not affect the results of arbitration nearly so much as does the particular type of industry.

6. The wage issue, including all money disputes, is the most frequent cause for grievances being submitted to arbitration, accounting for 33.6% of the cases in this sample. Discharge and Seniority ranked second and third, respectively. There were 3.27 discharges to every case of disciplinary action in the sample. Management Rights is a grievance topic which appears to be getting increasing attention each year.
7. The total number of cases per year presented to arbitration reached a peak in 1946, declined steadily to 1951 and leveled out in 1952.

THE STATISTICAL ANALYSIS OF A SELECTED SAMPLE OF LABOR GRIEVANCE ARBITRATION CASES

INTRODUCTION

The settling of labor grievance cases by the method of voluntary arbitration procedures is a relatively new development in the field of labor relations. There are a few cases of this method being used as far back as 1865 and railroads have made use of arbitration since 1905[1] but the emphasis was really placed on this area during World War II. Under the sponsorship of the N.W.L.B., and due to the prominence of "no strike clauses" contained in negotiated contracts, employers and unions alike were motivated to use arbitration as a means of settling differences of opinion in contract clause interpretation. Formal grievance procedures were set up in which the final step was submission of the case to an arbitrator, whose decision was accepted as final by both parties.

The N.W.L.B. at first furnished arbitrators to the disputing parties free of charge. Such a practice led to the over-emphasis of arbitration to such an extent that those concerned were submitting any or all of their cases to arbitration. To paraphrase Davey[2], they were not making reasonable attempts to settle the controversy at lower levels of procedure. This practice could have led to widespread abuse

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1. Lapp, J. A., Labor Arbitration, Principles and Procedures, Deep River, Conn., National Foremen's Institute, 1942, p. 7.

2. Davey, H. W., Contemporary Collective Bargaining, New York, Prentice-Hall, Inc., 1951, p. 297

of the arbitration method and was resulting in gross misunderstanding of its basic philosophy. A partial solution was arrived at by having both parties share the expenses of arbitration.

Other difficulties encountered in the use of the arbitration process in labor management disputes have been listed by Davey[3] as four major private hazards. These are summarized as follows:

1. Failure to appreciate the fundamental distinction between mediation and arbitration, frequently resulting in an operating assumption that arbitration is essentially a political rather than a quasi-judicial process.
2. An over-optimistic estimate of the effective scope of labor arbitration.
3. A tendency to utilize the arbitration process primarily as a face-saving mechanism, instead of attempting to improve the handling of disputes at the lower levels of grievance procedure.
4. A failure to recognize that too frequent arbitration may well prove as destructive of sound labor relations as neglecting to provide for arbitration machinery at all.

In this short period of history, several books have been written on this controversial subject, some of them projecting hypotheses which add some fuel to the fires of controversy.

Are the unions really more adept at presenting their cases to the impartial arbiter than are the management representatives?

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3. Ibid., page 298

> One reason why the unions so strongly favor arbitration is their knowledge that nine times out of ten their mastery of the processes of arbitration will not be matched by the employer[4].

Do unions tend to bring a great many cases to arbitration which they know beforehand to have no merit, merely to impress their membership?

Are some arbiters other than impartial in their judgement of cases?

> It may come as a shock to the inexperienced to learn that some arbitration proceedings are simply formalities preliminary to the rendering of an award. But such is the case. Some employers have been parties to a fixed award without their knowledge. Some others have been in on the fix.[5]

In speaking of contesting of awards in civil courts, F. Kellor has said, "The most frequent ground for attacking an award is the alleged partiality or bias of an arbitrator."[6]

After all, the militant rise of the labor union on the industrial front in the past two decades has been of such dynamic nature that the difficulty of a thinking man in remaining impartial to the situation should be easily recognized. Kellor also stated:

> It is the considered belief, out of this experience, that the difficulty lies in finding men without bias for or against labor or management rather than those having special aptitudes for dealing with human relations.[7]

4,5. National Foremen's Institute, Pitfalls to Avoid in Labor Arbitration, Deep River, Conn., 1946, p.4, 5.

6. Kellor, F., Arbitration in Action, Harper and Brothers, 1941, p. 174.

7. Op. cit., p. 30

What does the size of a union or company have to do with the number and types of grievances brought to the final step of arbitration?

Are some types of grievances more 'popular' than others?

> The major dispute which brings an impasse in negotiations between employers and employees is over wages. Probably disputes on this subject will never cease as long as human progress continues.
>
> Discharge and discipline of employees are among the most numerous of the causes of controversy which come up through the grievance steps.[8]

Are any trends to be detected over a period of time in number and types of cases?

This thesis represents an endeavor to find the answers to some of these questions, some proof one way or the other as to the truth of hypotheses advanced by others in this field. The method used in this thesis to attack the area of study will probably not bring forth answers to all the aforementioned questions but perhaps it will shed some light, motivating other research on the project.

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8. Lapp, Labor Arbitration, Principles and Procedures (Ibid.)

PROPOSED METHOD OF APPROACH

The proposed method is to attempt an analysis of a large population of grievance cases extending from the year 1945 to 1953. As a source of this population, the first twenty volumes of the Bureau of National Affairs Labor Arbitration Reports[9] are used interchangeably with the volumes of American Labor Arbitration Awards[10] published by Prentice-Hall, Inc. The cases contained herein were presented in such a manner as to facilitate tabulation. Enthusiasm for these convenient sources was tempered by the fact that these volumes do not contain all the arbitration cases which occurred during these last eight years.[11] These cases represent a selection by the Bureau of National Affairs or by Prentice-Hall from those cases which they did receive of the ones considered to be of most general interest. There are about 5,300 cases contained in these twenty volumes.

To choose a representative sample from this population, the following method was used. A die, containing the numbers one to six, was thrown for each sample selection. The number which came up was the number of cases to be counted forward from the last one recorded. In this way, a sample of 1,482 cases was tabulated from the total

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9. Bureau of National Affairs, Labor Arbitration Reports - Dispute Settlements, Washington, D. C.

10. Prentice-Hall, Inc., American Labor Arbitration Awards, New York.

11. Introductory Note to Vol. 1, Bureau of National Affairs Labor Arbitration Reports:

> The selection screens out only those awards on trivial issues and those which have such a specialized import that they would be of little or no value to anyone other than the parties.

universe, representing an average of one case for the sample from every 3.56 cases in the population. This could be termed a predetermined criterion in that the total number of cases in the population was known approximately and it was desired that the sample be significantly representative, yet not too unwieldy for mathematical manipulation.

Several different factors or combinations of factors could have been tabulated for each of these cases. The following list of factors was chosen for purposes of this analysis, for reasons to be explained later:

1. Date of the Case
2. Type of Industry
3. Union Involved
4. Profession of Arbitrator
5. Grievance Topic.
6. Decision For or Against Company
7. Location of Industry

To be sure, there are other factors which are important but which, in turn, are much harder to determine in the particular cases. The size and effects of size on the security of either union or company are important. The experience of the two parties in presenting their side of any grievance question is important. The number of grievances brought to the arbitration step in grievance procedure by any particular party would probably affect the results with interaction taking place as regards the efficacy of the Industrial Relations department of the company and the past history of labor relations. The method of arbitrator

selection by the parties will probably have some bearing on the outcome of cases. Do they name a permanent arbitrator in their contract each year or do they choose one "ad hoc" for each set of grievance cases? Perhaps they ask the American Arbitration Association or the Federal Conciliation Board to recommend several men, from whom they choose one. Do they use a panel containing Union and Company representatives, the chair being an impartial member?

In any event, the above listed factors were chosen as being basic enough to form a foundation for further study in this field. Since it had been determined at the outset of this work that it would be a statistical analysis, no attempt was made to judge the merits of the case. Some judgement had to be exercised in classifying some of the individual factors but no judiciary powers were exercised as to whether any decision was correct or incorrect. Only facts were recorded insofar as it was possible to determine them.

Figure I

KEYS FOR TABULATION OF SAMPLE CASES

Industry Type

Key Number	
01	Machinery, Manufacture, including electrical.
02	Metal Fabrication, Transportation, Shipbuilding, Aircraft Mfg., etc.
03	Metal Foundries, Rolling Mills
04	Miscellaneous, (includes Communications, Retail Stores, Warehousing, etc.)
05	Chemicals, Plastics, Soap, Drugs
06	Food, Tobacco, Grocery Stores, Breweries, etc.
07	Textile Mills, Apparel and Garments, Cleaners.
08	Building and Construction, Power and Water.
09	Lumber and Furniture, (includes Retail)
10	Paper Mills, Printing, Newspapers.
11	Rubber Manufacturing and Fabrication.
12	Stone, Clay, Glass, Cement, Ceramics
13	Leather, Shoe Manufacture
14	Petroleum, Coal, Gas, and Ore Mining.

The word which is underlined is the key word for the particular classification.

Figure 1

KEYS FOR TABULATION OF SAMPLE CASES

Number	Union
01	CIO -UAW & AIE Farm Equipment Workers
02	CIO Steelworkers, Industrial Workers, Toys, Shipbuilders, Wire & Metal
03	CIO Clothing, Textile, Paperworkers, Leather & Shoes, Lumber, Furniture
04	CIO Packinghouse, Retail and Wholesale, Food & Agriculture, Brewery, Barbers
05	CIO Mine & Smelter, Oil Workers, Gas, Coke & Chemical Cement, Glass.
06	CIO Public Workers, Utility Workers, Electrical Workers, Communication, Newspapers, Office Workers, Transport Workers, Optical & Photo Workers.
07	CIO Maritime, Longshoremen.
08	CIO Rubberworkers.
09	AFL Carpenters, Hod Carriers, Painters, Plumbers.
10	AFL Meatcutters, Bakery Workers, Grain, Distillery.
11	AFL Building Service, Trades Council, Hotel Workers, Street Railways, Municipal, Railroad Clerks, Retail Workers, Office Workers, Airline Pilots.
12	AFL Electrical Workers, Operation Engineers, Machinists, Stove Workers.
13	AFL Teamsters
14	AFL Garment Workers, Textile, Cleaning & Dye, Upholstering, Cartoonists, Boot & Shoe.
15	AFL Printing Presses, Papermakers, Papermills, Communication Workers.

The word which is underlined is the key word for the particular classification.

Figure 1

KEYS FOR TABULATION OF SAMPLE CASES

Number	Unions
16	AFL Chemical Workers, Rubber Workers, Brick & Clay Workers, Cement Workers, Metal Mines.
17	AFL Foundry Workers, Labor, Structural Metal Workers, Gas & Coke, Aluminum Workers.
18	AFL Firemen & Oilers, Longshoremen.
19	United Mineworkers
20	All other Independent Unions

Number	Grievance Topic
01	Discharge
02	Discipline (other than discharge)
03	Seniority, Transfer & Layoff, Veteran's Rights.
04	Promotion and Demotion
05	Wages (includes overtime, Holiday pay, Vacation pay, Premium pay, etc.), Job Classification & Rates.
06	Job Evaluation, Motion and Time Study, Machine Changes, Job descriptions.
07	Working Hours & Vacations, Time Off.
08	Management Rights (as described in particular contracts)
09	Union Security, Check-off, Union Shop, Steward Rules, etc.
10	Working Conditions, Clothing, Safety, etc.
11	Discrimination
12	Contract Clause Interpretation (when not covered by other categories)
13	Fringe Benefits, Hospitalization, Insurance, etc.

The word which is underlined is the key word for the particular classification.

Figure 1

KEYS FOR TABULATION OF SAMPLE CASES

Number	Arbitrator Profession
1	Lawyer
2	Professor
3	Law Professor
4	Industrial Arbitrator
5	Clergy
6	Profession Unknown

Number	Decision
0	Decision Awarded to Company
1	Decision Awarded to Union
2	Split Decision

Figure 1
KEYS FOR TABULATION OF SAMPLE CASES

Geographic areas of the United States

Area Symbol	Area Name	States Included	Area Symbol	Area Name	States Included
NE	North Eastern	Connecticut Maine Massachusetts New Hampshire Rhode Island Vermont	ESC	Eastern South Central	Alabama Kentucky Mississippi Tennessee
MA	Middle Atlantic	New Jersey New York Pennsylvania	WSC	Western South Central	Arkansas Louisiana Oklahoma Texas
ENC	Eastern North Central	Illinois Indiana Michigan Ohio Wisconsin	M	Mountain	Colorado Idaho Montana Nevada New Mexico Utah Wyoming
WNC	Western North Central	Iowa Kansas Minnesota Missouri Nebraska North Dakota South Dakota	P	Pacific	California Oregon Washington Arizona
SA	Southern Atlantic	Delaware Florida Georgia Maryland North Carolina South Carolina Virginia West Virginia Washington			

The Bureau of the Census has divided the United States into these nine major areas for convenience in presenting information in the annual Statistical Abstract of the United States (op. cit.)

Key for Factor Classification

Next follows an explanation of the key used for the classification of factors, such key being included as Figure (1).

In tackling this problem, there had to be a combination of groups within the classification of the four main factors.

It is obvious that nearly every arbitrator would have a different background so the major profession of the individual was chosen as being the most significant. Maybe his age, his political party, or his "alma mater" would have been more important.

When it came to categorizing the industries, the main headings of the system used by the Bureau of Census[12] was selected, these twenty titles being combined in certain ways to make the recording job simpler.

For the unions, the classification system embraced as many of the different ones as was practicable. For the initial recording, the CIO unions were kept separate from the AFL, the UMW, and the Independents. Within each classification, several unions were placed whose jurisdictions covered the same or reasonably related industries. Other than the UMW, all independents were grouped together in one cell, regardless of industry affiliation. This was determined to be logical since the majority of the cases reported in this particular population were filed by unions affiliated with one of the international Labor Organizations.

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12. U. S. Census Bureau: Statistical Abstract of the United States; 1952, Washington, D. C., Government Printing Office.

When one studies any table of grievance classifications,[13] it is easily seen that up to two hundred sub-titles could have been used, a practice which would have overloaded the procedure. Therefore, judgement entered again to help place each grievance in one of some fourteen categories. This is probably drastic collapsing of a factor, but not too much difficulty was experienced in fitting case grievance topics to the correct classification. The date that case decisions were rendered was recorded. The state in which the industry was located was also listed in order to later tabulate the industries in accordance with the geographical regions of the United States.[14]

Throughout the body of the thesis, the keyword for a classification will be used in conjunction with the key number when referring to a particular classification. It is to be inferred that all types of any particular item listed under a key number are included in the discussions unless specifically stated otherwise in those discussions.

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13. See Index Digest to Bureau of National Affairs, Labor Arbitration Reports (op. cit.)

14. Bureau of Census, Statistical Abstract of the United States, (op. cit.)

Tabulation of Sample Case Decisions

Once the recording of the sample cases was complete, the cases were distributed into cells according to the following combinations of factors:

1. Arbiter Profession vs. Industry Type
2. Arbitrator Profession vs. Union Classification
3. Arbitrator Profession vs. Grievance Topic
4. Industry Type vs. Union Classification
5. Industry Type vs. Grievance Topic
6. Union Classification vs. Grievance Topic
7. Industry Type vs. Regional Location.

In each of these cells were tabulated the percent of the number of cases per cell awarded to the company as well as the number of cases per cell. Thus, for a particular combination of any of the two factors, there is available a figure which represents the percent of cases in which the award was rendered favoring management and the number of sample cases which involved the particular combination.

These results were studied for basic significance, taking into account the total number of cases in each cell. Several of the cells contained too few cases to give any weight to their percentages but the figures were preserved for later use. Cases recorded as a split decision for company and union were not tabulated in this analysis, there being only thirty-one such cases in the total sample.

The Statistical Problem

Upon completion of the tabulation of the cases and of the computation of necessary percents, as shown in Figures 3 through 8, the requirement arose that the percent figures be tested for significant differences. For this purpose, Figures 3, 4, and 5 were chosen, representing a breakdown of the data into the following distributions:

1. Arbitrator Profession vs. Industry Type
2. Arbitrator Profession vs. Union Classification
3. Arbitrator Profession vs. Grievance Topic.

To carry out an analysis of the variance of the percent figures registered in each cell, it was necessary to do some re-grouping of the categories. No blank cells were desired and the decision was made to require at least ten cases per cell.

In order to do this, the categories were further collapsed and combined in a way to make the number of cases per cell more nearly even. A semblance of reasonableness was maintained by attempting to combine categories which were closely akin in function. For instance, in the industry block, miscellaneous, building and construction, lumber and furniture, paper and printing were combined as were chemicals, rubber, clay, and petroleum. Textile mills, apparel, leather and shoes were also combined into one category. The remainder of the regroupings is as shown in Figure (2). This collapse of classifications did succeed in providing more suitable distribution of cases, although not ideally so. Also, the particular distinguishing characteristics of the activities within classifications are not entirely lost due to this

type of regrouping. True, it becomes more difficult to put the finger on the one activity within a cell mostly responsible for any variations in results but a comparison of the regrouped results with the original data should help to resolve this problem. In any event, it was felt that this method of regrouping was more meaningful than would have been a straight mathematical collapse in order to get the number of cases per cell more ideally equal. To be sure, this is a compromise between subject content and statistical requirements, but a necessary compromise in order to proceed with the analysis. The problem set-up upon completion of this regrouping is as shown in Figure 9. All of the cells have at least ten cases.

Further discussion of this phase of the research will be reserved for the section entitled "Results of the Statistical Analysis".

Figure 2

KEYS FOR TABULATION OF SAMPLE CASES

AS REGROUPED FOR STATISTICAL ANALYSIS

New No.	Old No.	Industry Type
01	01	Machinery Manufacture, including electrical
02	02	Metal Fabrication, Transportation, Shipbuilding, Aircraft Mfg. etc.
03	03	Metal Foundries, Rolling Mills
04	04, 08 09, 10	Miscellaneous, Building and Construction, Lumber & Furniture, Paper Mills, Printing, Newspapers.
05	05, 11 12, 14	Chemicals, Plastics, Soap, Drugs, Rubber Mfg. & Fab. Stone, Clay, Glass, Cement, Ceramics, Petroleum, Coal, Gas, Ore Mining.
06	06	Food, Tobacco, Grocery Stores, Breweries, etc.
07	07, 13	Textile Mills, Apparel & Garments, Cleaners, Leather, Shoes.

New No.	Old No.	Union
01	01	CIO-UAW & AIE, Farm Equip. Workers
02	02	CIO Steelworkers, Industrial Workers, Toys, Shipbuilders, Wire & Metal.
03	03, 09	CIO Clothing, Textile, Paper, Leather & Shoes, Lumber, Furniture AFL Carpenters, Hod Carriers, Painters, Plumbers AFL Garment Workers, Textile, Cleaning & Dye, Upholstering, Cartoonists, Boot & Shoe.
04	04, 10	CIO Packinghouse, Retail & Wholesale, Food & Agriculture, Brewery, Barbers, AFL Meatcutters, Bakery, Grain, Distillery AFL Teamsters
05	05, 17	CIO Mine & Smelter, Oil Workers, Gas, Coke & Chemical, Cement, Glass, AFL Foundry, Labor, Structural Metal, Gas & Coke, Aluminum.

The word which is underlined is the key word for the particular classification.

Figure 2

KEYS FOR TABULATION OF SAMPLE CASES

AS RECORDED FOR STATISTICAL ANALYSIS

New No.	Old No.	Union
06	06, 11 12	CIO Public Workers, Utility, Electrical, Communications, Newspapers, Office, Transport, Optical and Photo. AFL Building Service, Trades Council, Hotel, Street railway, Municipal, Railroad Clerks, Retail AFL Electrical, Operations Engineers, Machinists, Stove.
07	07, 18	CIO Maritime, Longshoremen, AFL Firemen & Oilers, Longshoremen. CIO Rubberworkers AFL Chemical, Rubber, Brick & Clay, Cement, Metal Mines.
08	19, 20	United Mine Workers All other Independent Unions

New No.	Old No.	Grievance Topic
01	01, 02	Discharge, Discipline
02	03, 04 11	Seniority, Transfer & Layoff, Veteran's Rights, Promotion-Demotion, Discrimination
03	05, 13	Wages (Includes Overtime, Holiday pay, Vacation pay, Premium pay, etc.) Job classification & Rates, Fringe Benefits, Hospitalization, Insurance, etc.
04	06, 07 10	Job Evaluation, Motion & Time Study, Machine Changes, Job Descriptions, Working Hours, Vacations, Time Off, Working Conditions, Clothing, Safety.
05	08, 09	Management Rights, Union Security, Contract Clause Interpretation.

The keys for the other factors remained the same as for the original key.

The word which is underlined is the keyword for the particular classification.

GENERAL RESULTS AND ANALYSIS

TABLE 1

Percent of Arbiters Taking Part in Sample Cases
Listed by Professions

Profession	No. of Arbiters	% of Total No.	No. of Cases	% of Total Cases
LAWYERS	81	29.66	467	32.19
PROFESSORS	77	28.20	428	29.50
LAW PROFESSORS	43	15.75	255	17.57
INDUSTRIAL ARBITERS	46	16.88	248	17.09
CLERGY	2	.73	20	1.38
UNKNOWN	24	8.78	33	2.27
Total	273	100.00	1451	100.00

A study of the above table tells one a few facts of some interest if we assume that the sample is a representative one from its population. Lawyers and Professors are used in equal amounts as arbitrators and there are about twice as many of each active in the field as there are either law professors or industrial arbiters. Not enough cases arbitrated by clergy or unknown profession showed up in this sample to render the figures significant, and data relating to them will be left out of subsequent presentations.

There is implied correlation between the percent of total number of arbiters and the percent of cases arbitrated by the profession in each classification. No attempt was made to sustain this correlation by statistical analysis.

Percentages According to Arbiter Professions

TABLE 2

Overall Percentage of Case Decisions Awarded Company

Profession	Number of Cases	Percentage Cases Awarded Company
LAWYERS	467	43.9
PROFESSORS	428	48.3
LAW PROFESSORS	255	53.0
INDUSTRIAL ARBITERS	248	44.3

One might certainly conjecture a hypothesis from a glance at Table 2. Considering the limits of the population studied and the factors recorded for each case, the overall result as shown in Column 2, awards were rendered to the company in almost 50% of their cases no matter what the profession of the arbiters. This testimony is interesting if only to contrast it to the claims of several authors that lawyers are generally pro-management and professors pro-union. No attempt is made at this point in the thesis to substantiate these results with qualifying remarks. Suffice it to say for now, that several variables other than the ones recorded might have entered the picture to give the result obtained. These results were obtained by dividing the total number of sample cases per arbitrator profession by the total number of case decisions awarded the company per arbiter profession. No account was taken of the other factors involved.

Percentages According to Industry Type

TABLE 3

Overall Percentage of Case Decisions Awarded Company Listed by Industry Types

Industry Types		Number of Cases	Percentage of Cases	Awards to Company
Machine	01	321	22.10	43.6
Met. Fab.	02	317	21.82	47.6
Foundry	03	147	10.01	57.2
Misc.	04	59	4.06	39.0
Chemicals	05	70	4.83	50.0
Food	06	123	8.48	46.3
Textile	07	143	9.85	36.35
Stone	12	36	2.48	58.3
Petroleum	14	74	5.10	60.8

Table 3 was computed and is presented merely to give an overall picture of the results obtained, still keeping the observations general in nature. This table shows the distribution of 88.7% of the sample cases as regards industry. Foundries (03), Stone (12), and Oil (14) were awarded a larger percentage of cases than the others, Miscellaneous (04), and Textile (07) being awarded the smallest percent of decisions. The other four groups had percents varying from 43.6 to 50, indicating that they were breaking fairly even.

The "% of Cases" column affords an idea of the pattern of this population as regards industry participation. Machinery manufacture (01), metal fabrication (02), and foundries (03), made up more

than 50% of the total sample. The remaining 50% was divided up among eleven other types of industry. The boundaries of the population must be kept in mind when studying these data. The true pattern of this population as regards the industries can best be understood by reference to the "Number of Cases Per Cell" figures in Figure 10, which shows the distribution of industries according to the selected geographical areas of the continent. The Eastern North Central (ENC) area was the predominant one for the studied universe with Machinery (01), Metal Fabrication (02), and Foundries (03), comprising the greater part of industry in this area.

Percentages according to Unions

The following Table affords a general picture of the Arbitrator Profession vs. Union results comparing CIO, AFL, and Independents.

TABLE 4

Relationship of International Unions to Arbitrator Profession
Showing Total Cases Per Cell and Percent Awarded to Company

Union	01 Lawyers		02 Profs.		03 Law Prof.		04 Ind.Arb.		Over-all		% of Total Cases
	%	No	%	No	%	No	%	No	%	No	%
CIO	43.8	306	45.4	313	56.9	190	46.8	156	47.3	965	68.7
AFL	37.7	85	58.8	68	55.0	49	36.2	58	46.2	260	18.5
IND.	53.0	81	56.5	46	50.0	18	47.0	34	52.5	179	12.8

There is not much difference between the three different unions when looking at the overall percent of company decisions. Of interest is the fact that CIO affiliates accounted for 68.7% of the cases in this population. Since they are winning about the same amount of these cases as are the other two categories some good questions might be:

Is the CIO doing a better job of getting its grievances to the arbitration step? Are they "packing the calendar", relying on this 50/50 proposition? Do they naturally have this many more grievances than the other unions. To answer these questions would require the addition of another factor to the study, namely the relative size of the international organizations.

There is evidence of a departure from this apparent 50/50 trend of awards when the AFL data are studied. Lawyers and industrial arbitrators tended to render decisions favoring the AFL when handling grievance cases concerning its affiliates while Professors and Law Professors rendered awards favoring the company to about the same extent.

Everyone but the Industrial arbiter awarded a larger percent of decisions to management when confronted by independent unions. On the other hand, only the law professor rendered a majority of awards to the company when the CIO was a party to the dispute.

Arbitrator vs. Grievance Topic

The Arbitrator Profession vs. Grievance Topic, Block III, distribution afforded one result which confirmed the statement attributed to J. A. Lapp[15] on page 3. A major proportion of the grievance cases concerned themselves with money. This subject, in one form or another, accounted for 33.6% of the cases recorded. The overall percent of awards to the company was 47.4%.

When the grievance topic was management rights, (08), all arbitrators rendered awards favoring the company in about 70% of the cases while, for Union Security, (09), grievances, they favored the union 70% of the time.

When the very controversial subject of seniority arose, Lawyers and Professors awarded the decision to the Union in some 65% of the cases, while Law Professors and Industrial Arbiters kept to a more "middle of the road" policy, rendering company awards 50% and 55.5%, respectively.

It appeared rather difficult for the company to discharge an employee, none of the four main arbiter types going over the 50% mark on this issue. The companies did experience somewhat more ease in making their disciplinary actions other than discharge hold, with only the Professors awarding the company less than 50% of the decisions, their percent being 38.9%. If it could be assumed that the ratio of cases in these two categories, 3.27 discharges to one disciplinary action other than discharge, was valid, then management is still hasty in discharging a man before he gets a decent hearing. Such a

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15. J. A. Lapp (op. cit.)

situation would be a contributing factor in the success of the unions in having the man reinstated upon bringing the case to arbitration.

Analysis of Overall Results

This is a good point at which to make a few observations concerning the results obtained in this survey of grievance cases.

Lawyers and professors came out way ahead as the type of professional background most common to arbiters. That such was the case should not be surprising, due to the very nature of arbitration processes. These two professions afford the best area in which to locate people who can maintain an unbiased impartial attitude towards the disputes of labor and management. There is much less danger of any entangling alliances being formed than would be the case if politicians, executives, or labor leaders were used as arbiters. In this sample, however, the percentage of cases awarded the company was close to 50% in the majority of the combinations. It was noted during the survey of this population that the unions were the party responsible for bringing the case to arbitration with very few, if any, exceptions. At the same time, no proposal can be made that the unions should not have submitted 50% of these cases to arbitration. A matter requiring careful thought is whether this 50/50 split on decisions represents bias on the part of the arbitrator in an attempt to remain neutral, either consciously or sub-consciously.

Figure 3
Block I
Arbitrator Profession vs. Industry Types

Original Sample Data Tabulation Showing Percent Cases Won by Company and Number of Cases Per Cell

Industry Type	Lawyers		Professors		Law Profs.		Industrial Arbiter		Clergy		Unknown	
	No. 81		77		43		46		2		24	
	Cases 467*		428		255		248		20		33	
	% 43.9%		48.3%		53%		44.3%		45%		48.5 %	
	%	No.	%	No.	%	No.	%	No.	%	No.	%.	No.
01 Machinery	47.3	110	45.5	99	47.3	55	30.8	52	0.0	1	25.0	4
02 Metal Fabricators	43.4	115	53.8	104	53.5	43	36.8	49	33.3	3	80.0	5
03 Foundry	47.6	64	60.4	43	65.1	23	82.0	11	66.7	3	50.0	4
04 Miscellaneous	27.8	18	35.3	17	67.0	9	30.0	10			60.0	5
05 Chemical	43.5	23	38.9	18	60.0	10	64.3	14	60.0	5		
06 Food	42.8	37	50.0	38	58.3	24	30.0	20	0.0	2	75.0	4
07 Textile	38.5	26	31.6	38	40.8	49	37.0	27			0.0	3
08 Building	33.3	9	66.7	9	80.0	5	100	4	66.7	3		
09 Lumber	42.9	7	46.7	15	25.0	4	57.1	7	100	1	100	1
10 Paper	42.9	7	42.8	14	25.0	4	66.7	6	0.0	1	33.3	3
11 Rubber	44.4	9	33.3	3	69.3	13	0.0	2	0.0	1		
12 Stone	33.3	12	80.0	5	100	1	66.7	18				
13 Leather	37.5	8	0.0	5	0.0	2	46.2	13			0.0	2
14 Petroleum	65.2	23	61.9	21	61.5	13	53.4	15			50.0	2

*This figure represents the overall percent of cases won by the company for each arbiter class.

TABLE 5
Synopsis of Arbiter vs. Industry, Block I
Showing these Industries with 50% or Greater Company Decisions

Arbiter			
Lawyer 1	Professor 2	Law Professor 3	Industrial Arbiter 4
14	02	02	03
	03	03	05
	06	05	12
	14	06	14
		11	
		14	

Studying those cells in Figure 3 which contain enough cases (arbitrarily set at ten) to be considered of valid significance leads to one result as shown in Table 5. This table shows those industries which were awarded the decision in 50% or more of their cases when arbitrated by the arbiter type listed.

Metal Fabrication,(02), receives more awards when it appears before a professor or a law professor.

Foundries,(03), were awarded a majority of the decisions by each profession except the lawyer.

The Petroleum industry, (14) were rendered a majority of the awards no matter which type of arbitrator handled the cases. The unions involved with this industry classification were mostly CIO Oilworkers and United Mineworkers.

Table 6 is a synopsis of Figure 3, showing those industries which were awarded the decision in less than 50% of their cases by each of the Arbitrator Professions.

TABLE 6

Synopsis of Arbiter Professions vs. Industry
Block I
Showing Industries with Less than 50% Company Decisions

Lawyer 1	Professor 2	Law Professor 3	Industrial Arbiter 4
01	01	07	01
02	04	01	02
03	05		04
04	07		06
05	09		07
06	10		13
07			
12			

The most interesting result of this synopsis is that Textiles, (07), never succeeded in receiving the award in more than 45% of their cases, no matter what the arbitrator's background was. The relative strength of the unions is probably a contributing factor to this result.

Miscellaneous industries, (04) as listed, also were awarded less than 45% of the decisions in their cases by all of the arbitrator classifications.

A preliminary breakdown of the Arbitrator vs. Union, Block I, presented in Figure 4 in the same manner led to conclusions which merely tended to corroborate the results mentioned for the Arbitrator vs. Industry Block II. This was the case due to the fact that the industries could be lined up approximately with the unions who were usually opposite parties in disputes. Since the same sample of population is represented in this block, it was not deemed necessary to present results which would seemingly be a repetition of those made for the Arbitrator vs. Industry block.

FIGURE 4

Arbitrator Profession vs. Union Class, Block II

Original Sample Data Tabulation Showing

Percent Cases Won by Company and Number of Cases Per Cell

Union Class	Lawyers		Professors		Law Professors		Industrial Arbiter		Clergy		Unknown	
	%	No	%	No.	%	No.	%	No.	%	No.	%	No.
01 UAW	52.7	74	47.5	82	51.8	56	50.0	20			0.0	1
02 Steelworkers	45.4	88	53.0	70	74.0	27	48.2	27	100	1	75.0	4
03 CIO Clothing	44.0	25	36.0	50	40.0	50	48.6	35	100	1	0.0	3
04 CIO Packinghouse	31.8	22	33.3	30	50.0	16	25.0	12				
05 Mine	48.4	31	62.5	24	71.5	14	53.4	30	60.0	5	33.3	3
06 Public	35.9	53	34.2	41	57.0	14	39.3	28			66.7	3
07 Maritime	0.0	1	50.0	8	50.0	2	75.0	4				
08 Rubberworkers	42.8	7	50.0	8	63.6	11			50.0	2		
09 Carpenters	100	1	0.0	2			66.7	3				
10 Meatcutters	45.5	11	100	2	0.0	2	50.0	2				
11 Building service	30.8	13	40.0	5	50.0	2	28.6	7			100.0	1
12 AFL Electrical	35.3	17	80.0	15	58.8	17	33.3	12	66.7	3	0.0	1
13 Teamsters	43.8	16	61.5	13	71.4	7	30.0	10	0.0	3	66.7	9
14 Garment	25.0	8	16.7	6	55.5	9	27.2	11			50.0	2
15 Printing	0.0	1	66.7	3			100	1			50.0	2
16 Chemical Workers	100	3	100	5	100	4	50.0	4				
17 Foundry Workers	33.3	12	38.5	13	28.6	7	33.3	6	50.0	2		
18 Firemen	0.0	3	75.0	4	0.0	1	50.0	2				
19 UMW	73.4	15	57.2	7	100	3	80.0	5	0.0	2	100	1
20 Independent	43.5	66	56.4	39	46.7	15	41.4	29	0.0	1	0.0	3

FIGURE 5
Arbitration Profession vs. Grievance, Block III
Original Sample Data Tabulation Showing
Percent Cases Won by Company and Number of Cases per Cell

Grievance	Lawyers		Professors		Law Professors		Industrial Arbiter		Clergy		Unknown	
	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.
01 Discharge	39.7	63	46.0	74	47.7	44	36.8	49	50.0	6	44.4	9
02 Discipline	53.2	30	38.9	18	53.0	17	66.7	6			50.0	4
03 Seniority	36.0	75	35.0	60	50.0	40	55.5	27	60.0	5	75.0	4
04 Promotion	50.0	14	84.3	19	66.7	6	50.0	2				
05 Wages	47.0	166	47.1	138	54.2	85	44.2	95	40.0	5	33.3	12
06 Job Evaluation	80.0	5	71.4	7	40.0	5	75.0	4			0.0	1
07 Working Hours	33.3	30	31.0	29	66.7	12	33.3	15	0.0	2	100	2
08 Management Rights	75.0	32	66.7	24	79.0	19	68.8	16	0.0	1		
09 Union Security	9.1	11	38.8	18	60.0	5	18.8	16	100	1		
10 Working Conditions	50.0	6	83.3	7	60.0	5	100	2				
11 Discrimination	0.0	3	100	2			50.0	2				
12 Contract Clause	46.4	28	67.8	28	50.0	16	58.5	12			100	1
13 Fringe Benefits	0.0	3	60.0	5	0.0	1	0.0	3				

The same approach as was used in the Arbitrator vs. Industry block is applied to the Arbitrator vs. Grievance topic block, as shown in Table 7.

TABLE 7

Synopsis of Arbitrator Profession vs. Grievance, Block III
Listing Grievances for which Companies were awarded 50% or More of the Cases

Grievance	Lawyer	Professor	Law Professor		Industrial Arb.
	02	04	02	07	03
	04	08	03	08	08
	08	12	05	12	12

This table, a synopsis of Figure V, if it proves nothing else, helps to substantiate the thought which prompted keeping professors and law professors as separate professions when determining arbitrator classifications. There was some doubt existing as to whether a law professor would react as a lawyer or a professor, provided that a significant difference between these two did show up in the results. To avoid any confusion, a separate category was reserved for the law professor. Since the law professor rendered the award to the company in more than 50% of the cases in twice as many grievance topics as did the other three classifications, this separation of law professor from the two associated professions is deemed valid.

Management rights, (08), is present in all four columns showing that such rights still exist, even though they are becoming increasingly difficult to define[16].

No. 12, contract clause interpretation, is present in three of the columns. This was a catch-all classification but the results show that the companies may understand the contract language more thoroughly than do the unions involved.

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16. See Chamberlain, N. W., The Union Challenge to Management Control, New York, Harper and Brothers, 1948.

TABLE 8

Synopsis of Arbitrator vs. Grievance, Block III
Listing Grievance for which Company
Won Less Than 50% of Cases

Lawyer 1	Professor 2	Law Professor 3	Industrial Arbitrator 4
01	01	01	01
03	02		06
06	03		09
09	06		11
11	09		
14	11		

This synopsis bears out the statement that lawyers and professors tend to render the awards to the Union on most grievance topics.

The awards are rendered to the Union in the case of discharge, (01), in all four columns.

Wages, (05), Working hours and vacations, (07), and Union Security, (09), are present in three columns.

Therefore, these four classifications are noted as being the best topics for the unions to use as grievances. As a hypothesis, if the unions would avoid selecting law professors as arbitrators and stick to the above four grievances until they better understand contract language and the management rights area, they would probably succeed in winning a greater percent of their cases. The data presented may not prove this hypothesis but it does indicate that such an approach may be worth a try. In order to remain impartial, it is only fair to state the converse of this hypothesis; namely: Management should attempt to settle grievances of these four classes prior to arbitration, or study their personnel practices with a view toward improving same to prevent such grievances from ever arising.

FIGURE 6

Distribution of Sample Cases According to Industries and Unions
Showing Percentage of Company Awards and Number of Cases per Cell

Unions	01 Machine		02 Met. Fab.		03 Foundry		04 Miscel.		05 Chemical		06 Food		07 Textile	
	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.
01 UAW	42.7	103	59.2	108	35.2	17	100	1	100	1				
02 Steel	58.2	22	42.0	93	63.8	90	0.0	1	100	1	100	1	40.0	100
03 CIO Cloth.	0.0	1	0.0	1	100	1			100	1				
04 Pkg House							0.0	8	28.6	7	40.0	59	100	2
05 Mine			50.0	2	63.9	19	100	1	52.0	25	100	1		
06 Public	39.0	82	47.5	19	0.0	2	25.0	12	50.0	2				
07 Maritime			25.0	8			100	4	50.0	2				
08 Rubber			0.0	1					75.0	4			50.0	2
09 AFL Carp.			0.0	1					100	1				
10 Meatcut											43.8	16		
11 Building	100	1	23.1	13			57.1	7	0.0	2	100	1	0.0	1
12 Electric	44.2	34	55.6	9			66.7	6						
13 Teamster	0.0	1	60.0	10	100	1	57.1	7	0.0	1	56.6	30	0.0	1
14 Garment			0.0	2			50.0	2					26.9	26
15 Printing							0.0	1						
16 Chemical							0.0	1	100	5				
17 Foundry	25.0	8	42.8	14			0.0	2	50.0	2	50.0	2		
18 Firemen			0.0	1			0.0	3			60.0	5		
19 UMW	100	2	50.0	2					62.5	8	100	2	0.0	2
20 Independ.	46.6	60	71.5	21	50.0	6	40.0	5	25.0	8	33.3	3	16.7	6

FIGURE 6

Distribution of Sample Cases According to Industries and Unions
Showing Percentage of Company Awards and Number of Cases per Cell

Unions	08 Building		09 Lumber		10 Paper		11 Rubber		12 Stone		13 Leather		14 Oil	
	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.
01 UAW							50.0	2	0.0	1				
02 Steel							0.0	1					75.0	4
03 CIO CLOTH.			50.0	24	40.0	10	50.0	4			33.3	18		
04 Pkg. House			0.0	2	27.3	11							0.0	1
05 Mine	100	1					0.0	1	62.5	10	0.0	1	56.4	39
06 Public	83.6	6							40.0	5				
07 Maritime									100	12				
08 Rubber			100	1			56.2	16			0.0	1	0.0	2
09 AFL Carp.	0.0	9							100	9				
10 MeatCut											100	1		
11 Building														
12 Electric	77.8	9							0.0	1			100	1
13 Teamster	100	1	0.0	1	0.0	1			0.0	1			0.0	1
14 Garment			66.7	3			66.7	3						
15 Printing					60.0	5								
16 Chemical			100	1	100	1			100	4			50.0	2
17 Foundry			0.0	1	0.0	1			100	1				
18 Firemen													100	1
19 UMW	75.0	4							100	1	50.0	2	77.8	9
20 Independ.	33.3	6	50.0	2	50.0	2			50.0	2	14.3	7	69.2	13

FIGURE 7

Distribution of Sample Cases According to Industry Type and Grievance Topic Showing Percentage of Cases Awarded to Company and Number of Cases per Cell

Grievance Topic	01 Machine		02 Met.Fab.		03 Foundry		04 Miscel.		05 Chemical		06 Food		07 Textile	
	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.
01 Discharge	44.7	47	28.6	63	32.4	21	54.6	11	25.0	12	31.2	16	54.1	24
02 Discipline	37.5	24	55.0	20	58.5	9	100	1	100	1	50.0	2	42.8	7
03 Seniority	38.0	50	41.7	48	31.3	32	16.7	6	87.5	8	38.9	18	29.4	17
04 Promotion	62.5	8	45.5	11	100	1	100	1	75.0	4	100	2	33.3	3
05 Wages	46.2	117	46.0	100	62.5	48	45.5	22	50.0	24	50.0	44	31.6	57
06 Job Eval.	25.0	4	100	1	75.0	4			50.0	2			60.0	5
07 Work Hours	40.0	20	60.0	15	50.0	4	37.5	8	40.0	5	28.6	14	0.0	7
08 Mgement Rts	68.8	16	87.5	16	91.9	16	66.7	3	71.4	7	71.4	7	50.0	2
09 Union Sec.	33.3	12	46.1	13	100	1	0.0	2	50.0	2	12.5	8	20.0	5
10 Work Cond.	25.0	4	57.1	7	100	3			100	1	0.0	2		
11 Discrim.	0.0	1			100	2			0.0	1	0.0	1		
12 Contract Cl.	36.8	19	66.7	21	62.5	8	25.0	4	0.0	2	83.3	12	33.3	6
13 Fringe Ben.			0.0	1	100	1	0.0	2					0.0	3

FIGURE 7

Distribution of Sample Cases according to Industries and Grievance Topics
Showing Percentage of Company Awards and Number of Cases Per Cell

Grievance Topic	08 Building		09 Lumber		10 Paper		11 Rubber		12 Stone		13 Leather		14 Petroleum	
	%	No	%	No	%	No	%	No	%	No	%	No.	%	No.
01 Discharge	80.0	5	83.3	6	50.0	6	100	3	83.3	6	22.2	9	41.7	12
02 Discipline					66.7	3	100	1	50.0	4	50.0	2	50.0	6
03 Seniority	100	2	33.3	3	100	2	50	6	66.7	3	100	1	60.0	10
04 Promotion	100	4			100	1			100	1			50.0	4
05 Wages	36.4	11	43.7	16	20.0	10	45.5	11	27.3	11	38.5	13	80.0	20
06 Job Eval.			100	2			100	1			0.0	1	100	2
07 Work Hours	0.0	1	0.0	1	0.0	3	0.0	2	100	1	0.0	2	66.7	6
08 Mgt Rts	50.0	2	33.3	3	33.3	6	100	1	66.7	3			83.4	6
09 Union Sec.	50.0	2	0.0	1	0.0	1			0.0	1			0.0	2
10 Work Cond.							100	1	100	1			0.0	2
11 Descrim.									50.0	2				
12 Contract Cl.	100	1	0.0	1	100	2	0.0	1	66.7	3	33.3	3	66.7	3
13 Fringe Ben.	100	2	0.0	1	100	1							0.0	1

FIGURE 8

Distribution of Sample Cases According to Grievance Topics and Unions

Showing Percentage of Cases Awarded to Company and Number of Cases per Cell

Unions	01 Discharge		02 Discipline		03 Seniority		04 Promotion		05 Wages		06 Job Eval.		07 Work Hours	
	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.
01 UAW	42.5	40	45.0	20	37.0	46	60.0	5	53.6	69	50	2	37.5	8
02 Steel	45.2	31	53.9	13	32.7	49	50.0	6	57.6	66	66.7	3	66.7	12
03 CIO Cloth	48.6	35	45.5	11	36.9	19	50.0	2	40.3	62	40.0	5	0.0	5
04 Pkg Hs	0.0	9	50.0	2	27.3	11	100	2	51.9	27			16.7	12
05 Mine	47.6	21	50.0	2	53.8	13	50.0	4	66.7	27	66.7	3	0.0	4
06 Public	42.2	19	71.4	7	54.5	11	100	2	35.5	62	100	2	37.5	8
07 Maritime							100	1	42.9	7				
08 Rubber	75.0	4	0.0	1	60.0	5			42.8	14	100	1		
09 AFL Carp.	100	1							25.0	4			0.0	1
10 Meat Cut	50.0	2	0.0	1	0.0	1			42.9	7				
11 Bldg.	40.0	5			0.0	1			25.0	12			66.7	3
12 Electric	16.7	12	33.3	3	57.2	7	100	6	56.5	23	0.0	1	75.0	4
13 Teamster	47.0	17	100	1	0.0	1	100	1	43.5	23			42.9	7
14 Garment	83.3	6	100	1	50.0	2	0.0	1	15.4	13	75.0	4	0.0	3
15 Printing			100	1			100	1	0.0	1			0.0	1
16 Chemical	100	1	100	1	50.0	4	100	1	66.7	6			100	2
17 Foundry	33.3	6			40.0	5	0.0	1	15.8	19	50.0	2	0.0	1
18 Firemen	100	1			50.0	2			33.3	3			40.0	5
19 UMW	50.0	2	100	1	66.7	6	100	2	61.5	13			40.0	5
20 Independ.	36.4	33	50.0	12	50.0	24	40.0	5	47.8	46	50.0	2	33.3	6

FIGURE 8 (continued)

Distribution of Sample Cases according to Grievance Topics and Unions

Showing Percentage of Cases awarded to Company and Number of Cases per Cell

Unions	08 Management Rts.		09 Union Sec.		10 Work Cond.		11 Discrim.		12 Cont. Cl.		13 Fringe Benefits	
	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.
01 UAW	66.7	15	71.4	7	40.0	5	50.0	2	69.3	13		
02 Steel	92.9	14	33.3	3	100	5	100	1	69.3	13	0.0	1
03 CIO Clothing	70.0	10	50.0	2	100	1			37.5	8	0.0	4
04 Pkg Hs	50.0	2	0.0	7			0.0	1	42.8	7		
05 Mines	78.6	14	16.7	6	100	1	0.0	1	62.5	8	0.0	1
06 Public	71.4	7	12.5	8	33.3	3			20.0	10	0.0	1
07 Maritime	100	2	0.0	1	100	1	100	1	0.0	1		
08 Rubber	100	1	0.0	1					0.0	1		
09 AFL Carp.												
10 Meat Cut.	50.0	2							60.0	5		
11 Bldg.	0.0	1	66.7	3					0.0	1	0.0	1
12 Electrical	50.0	2	0.0	1					50.0	4	100	1
13 Teamsters	50.0	2	0.0	1	0.0	1			100	5		
14 Garment	0.0	2	0.0	2					50.0	2		
15 Printing	50.0	2									100	1
16 Chemical	100	1										
17 Foundry	100	2	66.7	3	100	1						
18 Firemen												
19 UMW	66.7	3			100	1						
20 Independ.	80.0	10	16.7	6					55.5	9	50.0	2

Distribution of Sample Cases by

Industry Type and Union Classifications

Figure 6 comprises a distribution of the sample cases according to industry type and union classification. The numbers in the "Number of Cases per Cell" columns show the degree of involvement of any one industry with the particular unions as far as grievances were concerned. Those numbers in the "percent" columns represent the degree to which the awards in the cases were rendered to the company.

Applying the heretofore mentioned arbitrary criteria of ten cases to the cell for significance, it can be noted that there are very few such cells in this figure. No analysis of variance technique was applied to this particular distribution of the data due to the fact that there were too many blank cells.

In those cells of Figure 6 which do contain enough cases to lend credence to the percent figures some interesting comparisons can be made.

When the union party to the dispute was the CIO-UAW,(01), the arbitrators rendered 42.7% of the awards in 103 cases favoring management of the Machinery Industry, (01). The Metal Fabricating Companies, (02), were rendered the awards in 59.2% of 108 cases involving the UAW, (01).

The CIO Steelworkers, (02), on the other hand, were awarded the decision in 58% of 93 cases in which Metal Fabrication, (02), was the opposite party. A pertinent comment to make at this point is that the Shipbuilding Industry and CIO Shipbuilders, units within Industry Type (02) and Union (02), respectively, no doubt were the

participants in the majority of these 93 cases.

Under the column headed Machine, (01), the arbitrator rendered awards favoring the company in only 39% of 82 cases. It can be assumed that these cases mostly involved the electrical manufacturers, part of Industry Type (01) and the CIO Electrical Workers, part of Union (6).

The Foundry Industry (03) was awarded 63.8% of 90 cases by the arbitrator when the union was the CIO Steelworkers.

An application of the possible use of this figure will be demonstrated in a hypothetical example to be presented later in this paper.

Distribution of Sample Cases

by Industry Type and Grievance Topic

The distribution of the sample by the method shown in Figure 7 helps to give the picture of how important the various grievance topics were to the particular industry types.

There was more even distribution of the cases in this figure than was the case in Figure 6, but there were still many blank cells as well as cells with less than ten cases. Again, for this reason, no analysis of variance was carried out to determine the significant differences between the cell percents.

This distribution is interesting, however, if only to note the difference in percents of awards rendered to the company as between different types of industry for the same grievance topic or between different grievance topics for the same type of industry.

For instance, Machinery, (01) was awarded the decision in

44.7% of 47 discharge, (01), grievances, Metal Fabrication, (02), was awarded the decision in only 28.6% of 63 cases. Yet, when cases considering discipline other than discharge, (02), arose, Machinery, (01), was rendered the award in only 37.5% of 24 cases while arbitrators rendered awards favoring the Metal Fabricating industry, (02), in 55% of 20 cases. Moving to the data displayed in the Wages, (05), row, it can be seen that both Machinery, (01), and Metal Fabricating, (02), were awarded the decision in 46% of 117 cases and 100 cases, respectively.

Studying further the Wages, (05), data, for those cells containing 25 or more cases, the Foundry Industry, (03), was rendered the highest percent of awards, 62.5% of 48 cases.

There has been earlier discussion of the Textile Industry, (07), and the data in this column of Figure 7 point out that the arbitrators awarded decisions favoring the company in only 31.6% of 57 cases involving wages, (05).

Use will also be made of this figure in the hypothetical example to be presented later.

Distribution of Sample Cases
By Union Classification and Grievance Topics

Figure 8 shows the distribution of the cases in the sample according to union classification and grievance topic. To maintain the continuity of the presentation, the percent figures appearing in Figure 8 still represent the degree to which awards were rendered to the management by the arbitrators. Perhaps it would have been more useful to have used the complements of these percents in this figure,

i.e., the percentage of decisions awarded to the unions by the arbitrators.

In any event, there are a few cells in Figure 8 worthy of notice, although the same criticism holds as was mentioned for Figures 6 and 7, namely, that there are many blank cells or cells containing too few cases to be termed significant.

The data listed under Wages (05) shows that industries involved with CIO Public Workers (06) were awarded decisions favoring the company in 35.5% of 62 cases while those industries whose employees were organized by the Steelworkers (02) were rendered the award in 57.6% of 66 cases.

Both the CIO-UAW (01) and the Steelworkers (02) had notable success with their Seniority grievances, the arbitrators awarding decisions favoring the company in 37% of 46 cases and 32.7% of 49 cases respectively.

This figure completes the original distribution of the sample cases by pairs of what are considered to be the most important factors in this study.

A Hypothetical Example to Demonstrate Application of Results

In order to demonstrate how the results obtained from this sample might be actually used by labor or management, the following hypothetical case problem will be discussed.

A metal fabrication (02) plant, its employees belonging to a local union of the CIO-UAW (01), is presented with a grievance involving wages. This plant is located in the Eastern North Central,

(ENC), area of the United States. Interested members of both the Union and management have access to the figures presented in this thesis.

They turn first to Figure 10 and see that, in 96 cases including all grievance topics, the decision was awarded to metal fabricating, (02), in this area 49% of the time.

Management looks at Figure 7 and discovers that for the entire metal fabricating industry, the arbitrators rendered awards favoring the company in 46% of 100 cases involving this particular grievance. At the same time, the union representative considers Figure 8 to find the result that, at the arbitration level, the decision was awarded to the company in 53.6% of 69 cases involving this grievance when his union was representing the grievant. This Figure does not take the type of industry into account.

Now both parties desire the results of those cases where metal fabricating, (02), and the CIO-UAW, (01), met across the arbitration bench so they proceed to Figure 6. Here the particular cell gives the result that the company was awarded the decision in 59.2% of 108 cases, considering all grievance topics.

These parties have named a law professor as their impartial arbitrator in their contract. Figure 3 tells them that the law professor has rendered awards favoring the metal fabricating industry in 53.5% of 43 cases.

Figure 4 imparts the information that the law professor has awarded decisions to the company in 51.8% of 56 cases involving the UAW. In Figure 5 it is noted that the same type arbitrator has

rendered awards favoring the company in 54.2% of 85 wage, (05), cases.

Now, four of the six percentages favor the company side slightly. The union will not be deterred from taking the grievance all the way to arbitration if they consider the merits of the case to be such as to abrogate the odds. On the other hand, such a situation should help both sides in the dispute to decide to exhaust all possibilities of settling the grievance at a lower step in the procedure. On a straight chance basis, in this problem, it is so close to being a 50/50 proposition that such a decision would be to their advantage.

Reason for Discussion of Data Prior to Analysis of Variance

This discussion of the data has been presented before attempting the statistical analysis for several reasons. Once the data recording was complete, it was noted that several cells were blank and that other cells had too few cases listed for them to be significant by themselves. Such cells were not discussed in these general remarks but were saved for the statistical analysis, since it was known that the process of classification collapse would be used in setting up the analytical problem. In other words, there was a desire to discuss the sample before the individual classifications became more complicated than they already were, even though there would be an attempt to keep the picture reasonably clear when carrying out the regrouping. True, some of the statements may have to be further qualified after the analysis is complete, but it is also hoped that certain of them may be validated and perhaps enlarged upon.

RESULTS OF THE STATISTICAL ANALYSIS

The analysis of variance of the percents in the individual cells was carried out as shown in Appendix A. The data, as shown in Figure 9, were normalized by transformation of the percent figures to a variable, X, being equal to the arcsin $\sqrt{\text{percent}}$. Three rectangular tables were evolved in accordance with the original tabulation using the following headings:

1. Arbitrator vs. Industry
2. Arbitrator vs. Union
3. Arbitrator vs. Grievance

The method used was the "differences among both column and row means". The 5% level was chosen to be the governing criteria as to whether or not differences were significant. The following table shows the results of the computation.

TABLE 9

Results of Analysis of Variance of
Percent Figures in Three Selected Blocks

Terms		Arbitrator vs. Industry	Arbitrator vs. Union	Arbitrator vs. Grievance
Col. Pop. Var.	$\hat{\sigma}^2_c$	54.567	99.601	16.703
Row Pop. Var.	$\hat{\sigma}^2_r$	108.905	64.953	8.845
Ind.. Pop. Var.	$\hat{\sigma}^2_e$	31.818	13.65	11.400
Col. to Col. Ratio	F_c	1.714	7.297*	1.465
Row to Row Ratio	F_r	3.423*	4.758*	
5% Level Ratio	$F_{.05_6}$	3.2	3.1	3.5
5% Level Ratio	$F_{.05_7}$	2.7	2.6	

*Those figures being greater than F_{05}, showing significant differences among the values concerned in those categories.

FIGURE 9

Regrouped Data Tabulation
Block I
Showing Percent Cases Won by Company
and Number of Cases per Cell

Industry Type		Lawyers %	Lawyers No.	Professors %	Professors No.	Law Professors %	Law Professors No.	Industrial Arbitrator %	Industrial Arbitrator No.
Machinery	01	47.3	110	45.5	99	47.3	55	30.8	52
Metal Fabrication	02	43.4	113	53.8	104	53.5	43	36.8	49
Foundry	03	47.6	63	60.4	43	65.1	23	82.0	11
Miscellaneous	04	33.2	41	45.5	55	54.5	22	55.5	27
Chemical	05	49.3	67	43.8	57	64.8	37	59.3	49
Food	06	42.8	35	50.0	38	58.3	24	30.0	20
Textile	07	38.2	34	27.9	43	39.2	51	40.0	40
Union				**Block II**					
UAW	01	52.7	74	47.5	82	51.8	56	50.0	20
Steelworkers	02	45.4	88	53.3	70	74.0	27	48.2	27
Clothing	03	40.0	35	34.4	61	42.4	59	42.6	54
Packinghouse	04	38.7	49	44.5	45	52.0	25	29.2	24
Mine	05	43.2	43	54.1	37	57.2	21	50.0	36
Public	06	33.0	88	45.9	61	57.6	33	36.2	47
Rubber	07	42.9	14	64.0	25	67.0	18	60.0	10
UMW	08	53.0	81	56.7	46	55.5	18	47.1	34
Grievance				**Block III**					
Discharge	01	44.1	93	44.6	92	49.2	61	40.0	55
Seniority	02	37.0	92	48.1	81	52.2	46	54.8	31
Wages	03	46.4	168	47.5	143	54.1	85	42.3	97
Job Evaluation	04	40.5	42	50.0	42	56.5	23	50.0	22
Management Rights	05	53.5	71	60.0	70	45.0	40	47.7	44

In the Arbitrators vs. Industry, Block I, Figure 9, figures showing differences between arbitrators were not significant to the 5% level, while the differences between industries were significant.

This fact allows one to collapse the arbitrator columns into one and reestablish overall percents of cases awarded to company for the particular industries, giving the following table:

TABLE 10

Showing Percentage of Company Awards Listed by Industries in Regrouped Classification

Industry		Number of Cases	Percentage of Total Cases	Percentage Awards to Company
			%	%
Machinery	01	316	22.35	44.0
Met. Fab.	02	309	22.00	47.0
Foundry	03	140	9.95	57.1
Misc.	04	145	10.30	45.5
Chemical	05	210	14.92	52.8
Food	06	120	8.54	45.0
Textile	07	168	11.94	36.3
Totals		1408	100	

These percentages show that Foundries, (03), were awarded a majority of the decisions in their cases as were those industries represented by Chemicals, (05). Although the remainder of the industries were not awarded a majority of the decisions in their cases, they came close to 50% with the exception of Textiles, (07), who were awarded the decision in only 36% of their cases. This result could be interpreted as indicating either the relative strength of the unions in this industry or the existence of some poor personnel practices on the part of management. A study of the next block, Arbitrators vs. Unions, should bear out this result.

Since the percent figures by arbitrator professions are not significantly different at the 5% level, and the percent figures by industry type are significant, another approach can be taken to results presented in Figure 9 , Block I. Each column of arbitrator professions can be studied individually.

TABLE 11

Percentage of Company Awards
By Lawyers

Industry	Mach. 01	Met.Fab. 02	Foundry 03	Misc. 04	Chem. 05	Food 06	Textile 07
% awarded companies with lawyer arbitrator	47.3	43.4	47.6	33.2	49.3	42.8	38.2

Table 11 shows that no industry was awarded more than 50% of its case decisions when the arbitrator was a lawyer, chemicals, (05), being awarded the highest percent, 49.3. 38.2% was the percent recorded for the company awards to Textile,(07). Two well known facts probably influence this result. The first is that the textile mills in New England, dealing with old and well established unions, have been having economic difficulties during most of the period studied, while the new textile mills in the south have only recently experienced the organization of their employees by the unions. Management, no doubt, is having its difficulties under both sets of circumstances. The other fact is that the unions involved with the garment industry have a long record of cooperation with management in solving the industry problems.

Due to this ability to cooperate, the union may find less cause for carrying grievance cases all the way to arbitration. If one does arise that must be settled by the arbitration process, the union, under such conditions, is more likely to receive the award.

Miscellaneous industries, (04), did not do well either when lawyers were the arbitrators, receiving the award in only 33.2% of their cases. Any attempt to find a reason for this figure will result in some guesswork. Reference to Figure 3, the original data sheet, shows that the larger percent of cases in the cell derived from industries which might be termed "small business", such as department stores and warehouses. Since the unions involved were affiliates of the international unions, it can be said that they were secure and in a better position to present their side of the grievances in a more efficient manner.

TABLE 12

Percentage of Company awards
by Professors

Industry	Mach. 01	Met.Fab. 02	Foundry 03	Misc. 04	Chem. 05	Food 06	Textile 07
% awarded companies with professor Arbitrator	45.5	53.8	60.4	45.5	43.5	50.0	27.9

In the above Table 12, some figures appear which are greater than 50%. Professors rendered the decision to the company when that company was a foundry or rolling mill (03) to the extent of 60% and in the case of metal fabrication and transportation (02) to the extent of 53.2%. These industry types usually named an arbitrator in their

contract and tended to retain the same man over a period of years. This evidences satisfaction on the part of both sides with the decisions rendered by that arbitrator. The unions involved are among the largest in the country and cannot be said to be insecure. On the other hand, their leadership is very alert and quick to pick up management on any wrongs they think the latter to have committed, but it should not be said that they tend to bring many cases to arbitration which have no intrinsic merit.

Textile industries, (07), were rendered the award in 27.9% of their cases when a professor arbitrated the grievances. This is further evidence that management of these industries is not being successful in presenting their story to the arbitrator or that they are experiencing serious personnel problems, due either to the character of their unions or their economic difficulties.

TABLE 13

Percentage of Company Awards
by Law Professors

Industry	Mach. 01	Met.Fab. 02	Foundry 03	Misc. 04	Chem. 05	Food 06	Textile 07
% of cases awarded company with law professor arbitrator	47.3	53.5	65.1	54.5	64.8	5[illegible].3	39.2

Table 13 shows the differences between the industry types in percent of cases awarded the company. Since these figures are significant it can be said that this is the type of arbitrator most favorable to management in this population. The textile and garment industry

is again the lowest type as regards percent of company awards, its 39.2% comparing unfavorably with all the other figures in this table. Arbitrators of this profession took part in more cases for this industry too, than did arbitrators of any of the other three professions.

The other industry types might well attempt to submit more cases to the law professor as an arbitrator, at least as an experiment to further test these results.

TABLE 14

Percentage of Company awards
by Industrial Arbitrator

Industry	Mfg. 01	Met.Fab. 02	Foundry 03	Misc. 04	Chem. 05	Food 06	Textile 07
% of Cases awarded Company with Industrial Arbitrator	30.8	36.8	82.0	55.5	59.3	30.0	40.0

In looking at Table 14, the foundries and rolling mills (03) receive the most awards when appearing before an industrial arbitrator. Yet this profession took part in less cases involving industry type 03 than did any other profession. This cell contains the smallest number of cases of any of the cells in this block.

Miscellaneous industry, (04), shows improvement over their percent in the lawyer column by having 55.5% of the awards rendered to them by the industrial arbiter. This result corresponds closely to the 54.5% awarded by the law professors, intimating that the type 04 industries should show more interest in these two professions as arbitrator sources.

Machine Manufacturers, (01), and metal fabricators and transportation, (02), and the food industries, (06), all had poorer results than did the Textile Industry in this particular column.

In the arbitrator vs. union block, both arbitrator differences and union differences were proved to be significant at the 5% level.

Table 15 shows the overall percents of cases won by company in accordance with union groups.

TABLE 15

Overall Percent of Cases Awarded Company
Listed by Union Groups

Union		Number of Cases	% awarded Company	Industry most closely associated
UAW	01	232	52.6	01, 02
Steelworkers	02	121	52.3	01, 02, 03
Clothing	03	209	39.7	07
Packinghouse	04	143	42.0	06
Mine	05	137	50.4	03, 05
Public	06	229	40.2	02, 04, 01
Rubber	07	67	59.75	04, 05
UMW	08	179	52.50	

For purposes of comparison, an extra column has been added to this table to show that industry group most closely associated with the particular union group. The percentage figures show that there was a fairly even split between company and union on case decisions except in a few cells. Union 03, the textile and garment workers group were awarded the decision in 60% of their cases, correlating closely with results obtained in the arbitrator vs. industry block.

The UAW-CIO, (01) did not receive the award in 52.6% of their cases. This figure is somewhat high compared with the 44.0% and 47.0%

recorded for the major industries, (Machinery, (01), and Metal Fabrication, (02), respectively), associated with the UAW. It should not be disregarded, however, because both of these industries are further involved with other union groups, which fact probably accounts for the difference.

The Teamsters, (04), is fairly free from obscuring entanglements and the 42% awards to company correlates well with the 45.5% recorded for food industry, (06). The Rubberworkers, (07), having the smallest number of cases, afforded the companies the best percent of awards, 59.75%. In retrospect, it would have been more significant had Rubberworkers, (07), been combined with Mine and Smelter, (05), in the regroup step, because the AFL Chemical Workers were in Group (05).

Studying the entire regrouped Block II, (Figure 9), the first figure to stand out is the cell of Union (02), CIO Steelworkers and Shipbuilders, vs. the law professor. Here the company was awarded 74% of the decisions. Following this column through the rest of the cells, the interesting figures are as follows:

The law professor rendered decisions favoring the CIO Mine and Smelter Union, (05), in only 42.8% of the cases.

Electrical Union, (06), were awarded the decision in 42.4% of their cases and the Rubberworkers, (07), in 33% of their cases.

In all, the law professor favored the company in seven out of the eight cells by various margins. Such a result was discussed concerning the law professor in the Arbitrator vs. Industry Block.

The unions were awarded a higher percent of the awards by the other arbitration classifications with the exception of the Rubberworker's Union, (07), awarded the decision in 33% of their cases with

law professors and 40% of their cases when an industrial arbitrator made the decision.

In the third block, arbitrator vs. grievance topic, neither the rows or the column differences turned out to be significant at the 5% level. For this reason, there will be no discussion of grievance topics in this section of the thesis, although the results obtained are included for those interested in studying them. The hypothesis stated on page 33 , therefore, is not valid at the 5% level.

CONCLUSIONS

An interpretation of the results of this sample study is now in order to determine whether or not answers have been found to any of the questions posed in the introduction.

The first one of these was:

> Are the unions more adept at presenting their cases to the impartial arbitrator than are the management representatives?

Since the predominating percent appearing in this study is 50%, the answer to this question is that both sides are equally adept at presenting their cases. Looking at the overall picture, there is not any basis for saying that either of the parties was more clever than the other in carrying out the grievance arbitration process. The textile and garment industry is the one notable exception to this statement.

The second question was as follows:

> Do unions tend to bring a great many cases to arbitration which they know beforehand to have no merit, merely for the purpose of impressing their members?

No real answer to this question appeared in the data, unless one would be willing to state that winning only 50% of the cases is a poor record for that side of the dispute which is primarily responsible for instigating the arbitration action. Some further discussion, in terms of impressions gathered while reading cases might be in order to help clarify this question. Some of the cases read like comic strips. Perhaps, to the immediate grievant, the outcome of

his case was a most important matter, but, in some of the cases, there was an impression of a "tongue-in-cheek" attitude. There were also plenty of cases that showed the company management to be making bad errors of judgment. The percent of cases awarded to the company on discharge grievances helps to point this up. It was evident that several of the cases should never have been presented to an arbitrator but it is certainly not true that the union should be blamed any more than management for such cases arising. As has been already stated, no planned attempt was made to make any judgments on the merits of any particular case for this study. Such an attempt would be impossible anyway, unless someone had requested a mere opinion.

The next question is the crucial one:

Are some arbitrators other than impartial in their judgment of cases?

First, there should be an explanation of the question. This question is not meant to impugn the motives of the arbitrators or to engage in character defamation. This question is asked in the sense of pure mathematical percents derived from the study of this sample. For this reason, no proper names have been mentioned in this work. There is an interest in determining how the different professions used in arbitration react in similar situations. Two facts help us to give an answer to this interesting question. In two of the three blocks, Arbitrator profession vs. industry type and Arbitrator profession vs. grievance topic, the differences between Arbitrator professions were not significant at the 5% level, meaning that any

differences were practically the result of pure chance. Then there is the fact that the majority of the percents tabulated in these cells were close to being the same, i.e., near 50%. Thus the answer to the question is a qualified one. If the arbitrators were other than impartial, they were partial to practically the same extent.

In the Arbitrator profession vs. Union block, the differences between arbiters was significant at the 5% level. This leads to the conclusion that there is a probability of some type of interaction between the two in these cells.

The overall results of a 50/50 split can be thought of as a healthy proposition for the future of labor-management arbitration in one respect. Any other result would probably have led to charges of personal bias on the part of arbitrators or the rationalization that the winning side was more adept at case presentation. However, there is also the possibility that the arbitrator who does not appear to operate on a 50/50 basis is the real impartial arbitrator. The psychologists might well be able to substantiate the statement that the 50/50 law is a prominent one in situations such as arbitration, being applied either consciously or subconsciously on the part of the person making the decision. Therefore, a person showing a radical departure from the 50/50 proposition might conceivably be passing judgment on the pure merits of the case.

The next question listed was:

> What does the size of a union or a company have to do with the number and type of grievances brought to the final step of arbitration?

There was no attempt made to record the size of either company or union in this work so no answer is provided to this question. A proposed method to use in determining an answer to this question might be the following: Make a selection of definite companies as to size as well as to type and follow them through a large sample of grievances. The selected companies should be associated with enough unions of different size to cover the various combinations such as large company vs. large union, small company vs. large union, etc. A study could then be made of the number and type of grievances according to these combinations of company and union.

A question which was answered by this survey was:

Are some types of grievances more popular than others?

Although the differences in percent of cases won by company turned out not to be significant at the 5% level the percent of cases in the sample can be used to answer the above question. The following table gives the rank order of grievances in order of occurrence for this sample, according to original method of recording data.

TABLE 16

Overall Rank Order of Grievance Topics

Rank Order	Grievance Topic Number	Percentage of Total Cases %
1	05	33.6
2	01	16.88
3	03	14.52
4	08	6.34
5	07	6.20
6	12	5.86
7	02	5.18
8	09	3.52
9	04	2.82
10	06	1.51
11	10	1.31
12	13	.82
13	11	.48

The original recorded data are used because it gives a better idea of what the grievances actually were than does the regrouped classification used in the statistical analysis.

The first three grievances, in order of occurrence, were, namely, wages, discharge, and seniority, accounting for 65% of the sample cases. This fact emphasizes the importance of these three areas in labor-management relationships. When one studies the imposing array of different types of wage rates, any or all of which might be applied to an individual employee on one work shift it is easy to see how enough disputes can arise to lift this grievance topic above the rest as a trouble source. To quote from a book by Neil Chamberlain: [17]

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17. N. Chamberlain (ibid.) p.80

> In most industries there are provisions, often numerous, for special cases, providing for such contingencies as the wage to be paid a worker temporarily assigned to another job than his own, or the provisional rate to be paid pending the setting of the permanent rate, or the rate to be paid when production must proceed under handicaps. Certain general conditions are likewise established, as for example, the payment of equal wages for equal work, of differentials, in favor of night workers, of overtime or penalty rates under given circumstances, of minimum "call in" time when employees report for duty without previous advice that work is not available.

There is no difficulty in understanding how confusion over the amount of a pay check on the part of an employee can lead to arguments resulting in a legitimate grievance. Of course this category included other subjects involving money, such as vacation pay and paid holidays, and the complicated rules governing their payment also lead to trouble.

For reasons of general interest, the sample cases were distributed according to industry type and continental geographical area. The results of this distribution are shown in Figure 10.

Comparing cells containing nearly the same number of cases and for those industry types in the same geographical region, it can be noted that there is a wide variation in the percents of awards rendered favoring management. This is as it should be because the solution of the analysis of variance problems pointed out that there was a significant difference between the percents registered for industry types.

There is some variation in the percent of awards rendered favoring the company when one industry type is studied as to its various significant locations. For instance, machinery, (01), is awarded the decision in 51.5% of 33 cases in New England while

FIGURE 10

Industry Type versus U. S. Geographical Area

Showing Percentage of Company Awards and Number of Cases Per Cell

Industry Type

	01 Mach		02 Met Fat		03 Foundry		04 Misc.		05 Chem		06 Food		07 Textile		09 Lumber		10 Paper		12 Stone		14 Petroleum	
Area	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No
NE	51.5	33	27.3	22	80.0	5	100	1	50.0	6	42.8	14	33.3	33	60.0	5	50.0	6			0.0	1
MA	47.9	48	43.6	39	51.5	33	34.6	26	39.2	23	44.0	25	27.8	18	28.6	14	30.0	10	40.0	10	80.0	10
ENC	42.2	116	49.0	96	44.2	43	50.0	2	60.0	5	53.0	34	25.0	4	50.0	4	75.0	4	60.0	15	81.7	11
WNC	43.8	16	50.0	6	20.0	5	50.0	4	100	2	35.7	14	100	1			0.0	1	100	1	80.0	5
SA	50.0	2	42.9	21	80.0	5	100	2	50.0	4	75.0	4	34.1	47	33.3	3	50.0	6	100	1	0.0	2
ESC	30.8	13	50.0	4	68.5	19	100	2	66.7	3	50.0	2	36.8	19	66.7	3			0.0	1	71.4	7
WSC	0.0	5	45.5	11	38.5	13	100	1	100	3	50.0	4	0.0	1			50.0	2	0.0	1	55.1	20
P	36.9	19	53.3	47	71.4	7	25.0	4	57.2	7	28.6	7	50.0	2	100	2	33.3	3	100	1	20.0	5

FIGURE 11

PERCENT DISTRIBUTION OF SAMPLE CASES
ACCORDING TO YEAR AND GRIEVANCE TOPIC

Grievance Topic	Year 1945	1946	1947	1948	1949	1950	1951	1952
No.Cases	54	291	265	208	178	139	128	131
01 Discharge	24.00	16.49	18.10	20.65	12.91	10.08	15.62	15.27
02 Discipline	5.55	4.47	2.64	7.69	8.43	5.04	5.47	6.87
03 Seniority	18.50	13.40	11.69	10.58	15.16	29.50	13.29	11.45
04 Promotion	3.70	2.40	2.26	3.37	1.69		4.68	5.35
05 Wages	22.20	42.60	40.35	38.45	35.96	26.60	25.00	29.00
06 Job Eval.			.75	.96	2.81	4.32	3.91	1.53
07 Work Hrs.	9.25	7.22	6.04	4.33	6.19	3.60	4.68	10.68
08 Mgt.Rts.	5.55	2.75	5.65	4.81	5.05	5.76	9.38	9.93
09 Union Sec.	7.40	3.44	4.90	3.37	1.69	3.60	2.34	2.29
10 Work Cond.		1.72	1.13	1.92		1.44	3.12	
11 Discrim.				.48	.56	1.44	.78	
12 Contract Cl.	3.70	5.16	6.04	2.88	7.30	7.20	10.16	6.87
13 Fringe Ben.		.35	.37	1.93	2.25	1.44	1.56	.76

receiving 36.9% of the awards in 19 cases on the Pacific Coast and 42.2% of the awards in 116 cases in the Eastern North Central area. This range of variation between percents is not so great between the regions as is the range of percents between various industry types.

The last question stated in the introduction was:

> are any trends to be detected over a period of time in number and types of cases?

Figure 11 represents an attempt to answer this question. The sample was distributed according to year and grievance topic, the result being the tabulation of percents of yearly total cases attributed to each grievance topic.

First, considering the total number of cases per year, the volume reached a peak of 291 cases in 1946 from whence it dropped to 128 in 1951 and remained at that level in 1952. The number of cases for 1945 in this sample is not valid since the complete year was not covered in the population.

The grievance topics remained in very nearly the rank order for each year as was discussed earlier in "General Results and Analysis" for the entire sample except in a few interesting instances. Table 17 is arranged to show the rank order of the grievance topics by year for only the first six rankings.

TABLE 17
Rank Order of Grievance Topics for Each Year Studied

Rank Order	1945	1946	1947	1948	1949	1950	1951	1952
1	Discharge 01	Wages 05	Wages 05	Wages 05	Wages 05	Seniority 03	Wages 05	Wages 05
2	Wages 05	Discharge 01	Discharge 01	Discharge 01	Seniority 03	Wages 05	Discharge 01	Discharge 01
3	Seniority 03	Seniority 03	Seniority 03	Seniority 03	Discharge 01	Discharge 01	Seniority 03	Seniority 03
4	Wk Hours 07	Wk Hours 07	Wk Hours 07	Discip- 02	Discip. 02	Con Cl 12	Con Cl 12	Wk Hours 07
5	UnSec 09	Con Cl 12	Mge Rt 08	Mge Rt 08	Con Cl 12	Mge Rt 08	Mge Rt 08	Mge Rt 08
6	Discip Mge Rt	Discip 02	UnSec 09	Wk Hours 07	Wk Hours 07	Discip 02	Discip 02	Discip Con Cl

Wages, (05), Discharge, (01), and Seniority, (03), continued to constitute about 60% of all cases each year. In 1949 Seniority displaced Discharge as rank order 2 nd the following year it outranked Wages, ranking first. Its percentage of cases per year rose from 15.16% of 178 cases in 1949 to 29.50% of 139 cases in 1950. This move might have been easier explained if it had occurred in 1946 or 1947 when many veterans were returning to their pre-war jobs. However, there was a recognized slight business recession in 1949, resulting in considerable layoff of employees by industry and there may have been some carry-over of Seniority cases to 1950.

Returning to a discussion of results shown in Figure 11, Management Rights, (08), appears to be getting increasing attention as a grievance topic. This subject consisted of 9.38% of the cases in 1951 and 9.93% of the cases in 1952 after having been in the 5% to 6% bracket for the previous years.

APPENDIX A

Solutions of Statistical Problems

Analysis of Variance

Differences Among Both Column and Row Means

APPENDIX A

Solution of Statistical Problem
Analysis of Variance
Differences Among Both Column and Row Means

The three blocks of percents, Figure 9, represented the regrouped data tabulation of the following combinations of factors of the sample cases:

Block I Arbitrator Profession vs. Industry Type

Block II Arbitrator Profession vs. Union Classification

Block III Arbitrator Profession vs. Grievance Topic

The blocks were treated separately to determine the differences among both column and row means. An analysis of variance was then made of the differences for each block to determine whether the differences were due to random causes only or were related to the potentially causative factors being studied.

The percent figures were first translated to a variable $X = \arcsin \sqrt{\text{percent}}$. The following symbols will be used in the presentation of the problem solution:

$_aT_k$ = column total

where
k = column number
a = block number

$_aS_m$ = row total

where
m = row number
a = block number

T = grand total of columns or rows
$_aQ$ = total variation
$_a\zeta_c$ = variation among column means
$_a\zeta_r$ = variation among row means

a^2_e = that part of total variation independent of both row to row and column to column variation.

$a\hat{\sigma}^2_c$ = estimate of column to column variance

$a\hat{\sigma}^2_r$ = estimate of row to row variance

$a\hat{\sigma}^2_e$ = estimate of chance variance

aF_c = ratio of column to chance variances

aF_r = ratio of row to chance variances

$F_{.05}$ = ratio of column to chance variance at 5% level

$F_{.01}$ = ratio of row to chance variance at 1% level

BLOCK I
ARBITRATORS

INDUCTRIES		1	2	3	4	5
	1	43.48	42.40	43.48	33.68	163.04
	2	41.24	47.18	47.00	37.38	172.80
	3	43.66	51.04	53.76	64.90	213.36
	4	35.22	42.40	47.60	48.15	173.37
	5	44.58	41.48	53.58	50.38	190.02
	6	40.38	45.00	49.78	33.20	168.36
	7	38.20	31.84	38.72	39.20	147.96
	T	287.26	301.34	333.92	306.89	1229.41

BLOCK I: Calculation of Variation

$T = 1229.41$

$\sum_{1}^{28} X^2 = 55370.180$

$\frac{T^2}{km} = \frac{(1229.41)^2}{28} = 53980.32$

$_1Q = \sum_{1}^{28} X^2 - \frac{T^2}{km}$

$= 55370.180 - 53930.320$

$= 1389.86$

$_1Q_c = \frac{1}{m} (_1T_1^2 + {}_1T_2^2 + {}_1T_3^2 \ldots\ldots + {}_1T_k^2) - \frac{T^2}{km}$

$= \frac{379003.142}{7} - 53980.320$

$= 163.70$

$_1Q_r = \frac{1}{k} ({}_1S_1^2 + {}_1S_2^2 \ldots + {}_1S_m^2) - \frac{T^2}{km}$

$= \frac{218,534.99}{4} - 53980.320$

$= 653.430$

$_1Q_c = {}_1Q - {}_1Q_c - {}_1Q_r$

$= 1389.86 - (163.70 + 653.430)$

$= 572.73$

Block I: Calculation of Variance Estimates

$k - 1 = 3 \qquad m - 1 = 6$

$(k-1)(m-1) = 18$

$$1\hat{\sigma}^2_c = \frac{1^{SS}c}{k-1} = \frac{163.70}{3} = 54.567$$

$$1\hat{\sigma}^2_r = \frac{1^{SS}r}{m-1} = \frac{653.43}{6} = 108.905$$

$$1\hat{\sigma}^2_e = \frac{1^{SS}e}{(k-1)(m-1)} = \frac{572.73}{18} = 31.818$$

Calculation of F's

$$1F_c = \frac{1\hat{\sigma}^2_c}{1\hat{\sigma}^2_e} = \frac{54.567}{31.818} = 1.714$$

$F_{.05} = 3.2 \qquad F_{.01} = 5.1$

$$1F_r = \frac{1\hat{\sigma}^2_r}{1\hat{\sigma}^2_e} = \frac{108.905}{31.818} = 3.423$$

$F_{.05} = 2.7 \qquad F_{.01} = 4.0$

$1F_r$ is significant at the 5% level

BLOCK II
ARBITRATORS

		1	2	3	4	S
	1	46.52	43.60	46.00	45.00	181.12
U	2	42.34	46.38	59.30	44.00	192.52
N	3	39.30	35.94	40.56	40.52	156.32
I	4	38.45	41.85	46.10	32.72	159.12
O	5	41.08	47.36	49.12	45.00	182.56
N	6	35.10	42.64	45.36	37.02	164.12
S	7	40.94	53.10	54.90	50.80	199.74
	8	46.70	48.82	48.15	43.36	187.03
	T	330.33	360.19	392.49	338.42	1422.43

Block II: Calculation of Variation

$T = 1422.43 \qquad \sum_{1}^{32} X^2 = 64268.430 \qquad \frac{T^2}{km} = \frac{(1422.43)^2}{32}$

$2^{q} = \sum_{1}^{32} X^2 - \frac{T^2}{km} \qquad = 63228.35$

$= 64268.430 - 63228.350$
$= 1040.08$

$2^{q}c = \frac{1}{m}\left({}_2T_1^2 + {}_2T_2^2 + \cdots {}_2T_k^2 \right) - \frac{T^2}{km}$

$= \frac{663217.220}{8} - 63228.350$

$= 298.803$

$2^{q}r = \frac{1}{k}\left({}_2S_1^2 + {}_2S_2^2 + \cdots {}_2S_m^2 \right) - \frac{T^2}{km}$

$= \frac{254732.08}{4} - 63228.35$

$= 454.67$

$2^{q}e = 2^{q} - 2^{q}c - 2^{q}r$

$= 1040.080 - (298.803 + 454.67) = 286.607$

Block II: Calculation of Variance Estimates

$k - 1 = 3, \quad m - 1 = 7$

$(k - 1)\cdot(m - 1) = 21$

$$\hat{2\sigma}_c^2 = \frac{2^{\prime}c}{k-1} = \frac{298.803}{3} = 99.601$$

$$\hat{2\sigma}_r^2 = \frac{2^{\prime}r}{m-1} = \frac{454.67}{7} = 64.953$$

$$\hat{2\sigma}_e^2 = \frac{2^{\prime}e}{(k-1)(m-1)} = \frac{286.607}{21} = 13.65$$

Calculation of F's

			$F_{.05}$	$F_{.01}$
$2F_c = \frac{\hat{2\sigma}_c^2}{\hat{2\sigma}_e^2}$	$= \frac{99.601}{13.65}$	$= 7.297$	3.1	4.8
$2F_r = \frac{\hat{2\sigma}_r^2}{\hat{2\sigma}_e^2}$	$= \frac{64.953}{13.65}$	$= 4.758$	2.6	3.9

Both $2F_c$ and $2F_r$ are significant at the 1% level.

BLOCK III

ARBITRATOR

GRIEVANCE	1	2	3	4	S
1	41.65	41.90	44.52	39.20	167.27
2	37.50	43.95	46.22	47.78	175.45
3	42.94	43.60	47.36	40.58	174.48
4	39.50	45.00	48.70	45.00	178.20
5	47.00	50.80	42.10	43.72	183.62
T	208.59	225.25	228.90	216.28	879.02

BLOCK III: Calculation of Variations

$T = 879.02$ $\qquad \sum_{1}^{20} x^2 = 38856.01$

$$\frac{T^2}{km} = \frac{(879.02)^2}{20} = 38,633.81$$

$$3Q = \sum_{1}^{20} x^2 - \frac{T^2}{km}$$

$$= 38,856.01 - 38.633.81$$

$$= 222.20$$

$$3Q_c = \frac{1}{m}\left(3T_1^2 + 3T_2^2 + \dots + 3T_k^2\right) - \frac{T^2}{km}$$

$$= 38.683.92 - 38,633.81$$

$$= 50.11$$

$$3Q_r = \frac{1}{k}\left(3S_1^2 + 3S_2^2 + \dots + 3S_m^2\right) - \frac{T^2}{km}$$

$$= 38,669.19 - 38,633.81$$

$$= 35.38$$

BLOCK III Calculation of Variations

$$3^{Q}_{c} = 3^{Q} - 3^{Q}_{c} - 3^{Q}_{r}$$

$$= 222.20 - (50.11 + 35.38)$$

$$= 136.71$$

$k - 1 = 3, \quad m - 1 = 4$

$(k - 1)\cdot(m - 1) = 12$

$$3\hat{\sigma}^{2}_{c} = \frac{3^{Q}_{c}}{k-1} = \frac{50.11}{3} = 16.703$$

$$3\hat{\sigma}^{2}_{r} = \frac{3^{Q}_{r}}{m-1} = \frac{35.38}{4} = 8.845 < 11.40 \therefore \text{ not significant}$$

$$3\hat{\sigma}^{2}_{e} = \frac{3^{Q}_{c}}{(k-1)(m-1)} = \frac{136.71}{12} = 11.40$$

			$F_{.05}$	$F_{.01}$
$3F_{c} = \frac{3\hat{\sigma}^{2}_{c}}{3\hat{\sigma}^{2}_{e}}$	$= \frac{16.703}{11.400}$	$= 1.465$	3.5	6.0

Neither column to column variation nor row to row variation are significant at the 5% level.

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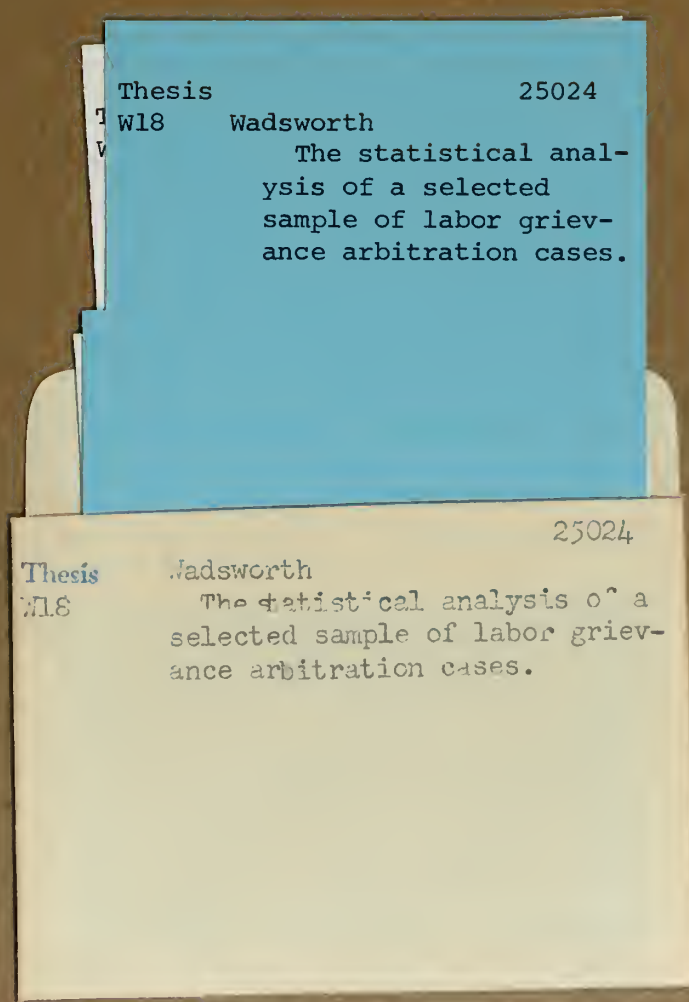
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The statistical analysis of a selected sample of labor grievance arbitration cases.
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